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COMPUTER TERMINOLOGY IN THE TAJIK LANGUAGE

1. Introduction

The present article deals with computer-related terminology in the Tajik language. This is a fast changing sphere of vocabulary in many languages of the world at present, as the related technologies undergo very rapid development. Thus, it is a particularly suitable part of lexis to study the newest tendencies in its development.

For reasons the discussion of which is far beyond the scope of the present article, in most languages of the world there is a strong tendency nowadays to borrow words especially from one source, namely the English language. The Tajik language, however, is a very peculiar and special case here as apart from English, two other sources of new vocabulary seem to play an important role: Russian and the Persian of Iran (henceforth referred to simply as [Standard] Persian or SP). In the case of the former, the over one-hundred-year long domination of the Russian and then Soviet empire, made the Russian language the main source of loanwords connected with technological development.¹ On the other hand, the linguistic and cultural ties between Iran and Central Asia facilitate the exchange of vocabulary. Persian and Tajik are often seen as just two dialects of one language and the syntactical rules, as well as ways of constructing compounds are practically identical. Thus, borrowing words from one to another is really easy. Now, when the artificial barriers created by the Soviet government exist no more, linguistic and cultural influences have become possible again. Moreover, as the degree of computerization in Iran seems to be higher than in Tajikistan, it is natural that new words relating to computers are introduced in Iran first.

As it has been stated above, the computer-related terminology seems to be particularly suitable to study the most recent tendencies in the development of vocabulary. As the most natural medium for transmitting forms belonging to

¹ The Soviet times being much more important as the number of Russian loanwords in Tajik in the tzarist period was very limited – Perry, 2005, p. 486.

this fast-evolving sphere of lexis is the Internet, the present research is based mostly on Tajik translations of computer programs and Tajik-language websites. Many of the analysed terms have not yet appeared in a printed form. The method chosen has, however, one obvious drawback – it is quite impossible, without comparing other sources, to eliminate forms generated ad-hoc and not really used. Thus, the present article is to be treated as an initial phase in the research.

As the present article deals to a certain extent with the word-formation processes, the author would like to present a list of the most productive mechanisms of this sort both in Tajik and Standard Persian:²

- **affixation**: prefixation and suffixation (the latter being much more common).
- **stable determinative phrases** (i.e. izofat structures): these are not true compounds, as they are not words *sensu stricto* (their elements retain separate word stress), but rather word groups. On the other hand they may possess new meaning, which is not necessarily evident from the simple analysis of their elements and they have to be explained in dictionaries.
- **stable coordinate phrases**: these are similar to the petrified determinative phrases as far as their status (not words but rather phrases) is concerned. The difference is that there is a relation of coordination (instead of determination) between their elements, and instead of the izofat construction marker, the conjunction (*vo*) appears.
- **determinative compounds**: true (or real) compounds – single words composed of two independent lexical items, joined by the relation of determination.
- **coordinate compounds**: compounds created by joining two or more independent lexical items, between which the relation of coordination exists.
- **petrified sentences (and sentence-like phrases)**: These are often complete sentences playing the role of a single lexical item, just like Persian *farāmuš-makon* ‘forget-me-not’, which – beside being a sentence – is used as a single noun (also in the plural). Parallels are to be found in other languages (Eng. *forget-me-not*, *merry-go-round*, etc.).

2. Internationalisms

The quantity of internationalisms in the sphere of terminology related to computers is particularly high in most languages of the world, and Tajik is by no means an exception here. Most of these internationalisms are of English

² For a thorough description of Tajik word-formation mechanisms (different in some points from the ones presented above), see Perry, 2005, p. 415 ff.

origin.³ It is worth mentioning that most forms belonging to this category exist also in Persian and in Russian. Let us analyse some examples:

Tajik form	Meaning	Commentary
<i>email (e-mail)</i> ⁴	email	SP <i>email</i> , ایمیل and ای میل (beside forms like پست الکترونیک or پست الکترونیکی etc.); Rus. <i>email</i>
<i>ramdisk</i> ⁵	ramdisk	SP <i>ramdisk</i> or رم دیسک; Rus. <i>ramdisk</i>
<i>вебкамера</i> ⁶	webcam	SP <i>webcam</i> , وبکم, وبکام and also رایابین (rare); Rus. <i>вебкамера, веб-камера, вебкамера</i> ; The ending of the Tajik form betrays Russian as its immediate source.
<i>интерфейс</i> ⁷	interface	SP اینترفیس; Rus. <i>интерфейс</i>
<i>карт</i> ⁸	[hardware extension] card	SP کارت; Rus. <i>карта</i>
<i>компьютер</i> ⁹ / <i>компутер</i> ¹⁰	computer	SP کامپیوتر; Rus. <i>компьютер</i> ; cf. <i>роёна</i>
<i>лаптон</i> ¹¹	laptop	SP لپ تاپ; Rus. <i>лаптон, лэптон, лептон</i>
<i>модем</i> ¹²	modem	SP مودم (Lat. characters); Rus. <i>модем</i>
<i>монитор</i> ¹³	monitor	SP مانیتور (beside نمایشگر); Rus. <i>монитор</i>
<i>ноутбук</i> ¹⁴	notebook	SP نوتبوک; Rus. <i>ноутбук</i>
<i>принтер</i> ¹⁵	printer	SP پرینتر; Rus. <i>принтер</i> ; cf. <i>чонгар</i>

³ I.e. they were either created in the English language according to its normal word-formation rules and then borrowed into other languages, or (at least) they were used for the first time referring to computers in this language.

⁴ Aspell (03.12.2005), Zamon (29.09.2005).

⁵ Mandriva (02.12.2005).

⁶ Libdetect (17.12.2005).

⁷ Libdetect (17.12.2005), Kivio (09.03.2006), Desktop_kdebase (09.03.2006).

⁸ Libdetect (17.12.2005).

⁹ Mandriva (02.12.2005), FS (29.09.2005).

¹⁰ FS (29.09.2005).

¹¹ Desktop_kdebase (11.01.2006).

¹² Libdetect (17.12.2005).

¹³ BH, p. 345.

¹⁴ Desktop_kdebase (11.01.2006).

¹⁵ Мушкилот ... (03.12.2005).

Tajik form	Meaning	Commentary
<i>сайт</i> ¹⁶	(web-)site	SP سایت; Rus. <i>сайт</i>
<i>сканер</i> ¹⁷	scanner	SP اسکنر; Rus. <i>сканер</i>
<i>файл</i> ¹⁸	file	SP پرونده beside فایل and فیل (rare); Rus. <i>файл</i>
<i>филтр</i> ¹⁹	filter	SP فیلتر; Rus. <i>фильтр</i> ; Note the monosyllabic structure of the Tajik, Persian and Russian forms as opposed to the English one.
<i>ҷойстик</i> ²⁰	joystick	SP <i>joystick</i> (Lat. characters) or جویستیک (rare); Rus. <i>джойстик</i>

Some attention should be paid to the word *сканер*. Initial consonant clusters are not acceptable in Persian and – theoretically – in Tajik as well.²¹ Thus, the oldest Russian loanwords in Tajik were pronounced and even written with a prothetic vowel,²² just like the words of Russian origin in the Persian of Iran (cf. استکان [estakān] < Rus. *стакан*; similarly: older Tajik *истакон*). However, from 1954 onwards, due to Stalin's own decision, all Russian loanwords and internationalisms in the languages for which the new Cyrillic orthography had been invented, were to be written according to their Russian spelling. This practice influenced (to various extent, depending on non-linguistic factors) the pronunciation and – as a result – some initial consonant clusters do appear now in the articulation of some Tajik speakers.²³ The form *сканер* provides some evidence that at least in writing the rule imposed by Stalin seems to be persistent even after the collapse of the Soviet empire. On the other hand, the fact that forms like *компютер* exist beside *компутер* reflects the hesitation as to whether to give up the imposed rules or not.

We also notice that in the most recent level of vocabulary, the traditional Persian-Tajik sound-laws do not work anymore, like in the case of Persian سایت *sāyt* as compared to Tajik *сайм*, while normally the Persian *ā* corresponds to the Tajik *o*.

An interesting orthographical feature of some of the analyzed borrowings (in Tajik, as well as in Persian and Russian) is the persistence of the original

¹⁶ Zamon (10.09.2005), Сайти интернетии ... (10.11.2005).

¹⁷ Libdetect (17.12.2005).

¹⁸ BH, p. 361, Mandriva (02.12.2005).

¹⁹ Aspell (03.12.2005).

²⁰ Libdetect (17.12.2005).

²¹ Perry, 2005, p. 25.

²² Perry, 2005, p. 486.

²³ Perry, 2005, p. 28.

Latin graphical form (see e.g. *modem* and *joystick* in Persian; *ramdisk* in Persian and Russian). Apart from that, examples of hybrid orthography may be found, too (see the form *webкамера* in Tajik and Russian).

Quite a special category in this group is formed by English abbreviations borrowed into Tajik (and other languages) *en bloc*, often pronounced as closely to the original as possible. A phenomenon similar to that affecting some other internationalisms may be noticed quite regularly in the case of these forms. Namely, they are often written in Persian, Tajik and even Russian texts with Latin characters, although sometimes they are transcribed or transliterated with – respectively – Arabic or Cyrillic letters, e.g.

Tajik form	Meaning	Commentary
<i>CPU</i> ²⁴	CPU (Central Processing Unit)	SP <i>CPU</i> / سی پی یو (beside descriptive phrases like واحد پردازشی مرکزی or واحد پردازش مرکزی); Rus. <i>CPU</i> / ЦПУ (beside <i>центральное процессорное устройство</i>)
<i>CD-ROM</i> ²⁵	CD-ROM (Compact Disk Read-Only Memory)	SP <i>CD-ROM</i> / سی دی رم، سی دی رام; Rus. <i>CDROM</i> / сидиром (rare); A similar example is <i>DVD-ROM</i> .

Another special category of internationalisms is the one containing forms that are or tend to be understood as proper names and – as such – are not translated. They may, on the other hand, be transcribed. E.g.

Tajik form	Meaning	Commentary
<i>Юникод</i> ²⁶	Unicode	SP یونی کد، یونیکد، یونیکود; Rus. <i>Юникод</i>
<i>Интернет</i> ²⁸	Internet	SP اینترنت; Rus. <i>Интернет</i>

Interestingly, examples of internationalisms common to Tajik, Russian and – of course – English that find no parallel in Persian are quite rare, e.g.:

²⁴ Mandriva (02.12.2005).

²⁵ Mandriva (02.12.2005).

²⁶ Aspell (03.12.2005).

²⁷ Note the tendency to show the morphological border in the Persian-Arabic orthography.

²⁸ Zamon (10.09.2005), Mandriva (02.12.2005).

Tajik form	Meaning	Commentary
<i>периферия</i> ²⁹	peripherals	Rus. <i>периферия</i> ; The form has a Russian ending.

The number of examples of internationalism of origins other than English is low, too. E.g.:

Tajik form	Meaning	Commentary
<i>экран</i> ³⁰	screen	From French <i>écran</i> via Rus. <i>экран</i> ; No parallel in Persian, where forms <i>پرده</i> and <i>صفحه</i> are used in this sense.

3. Linguistic calques

Apart from the great number of internationalisms, some linguistic calques of English forms are also to be found in Tajik, e.g.

Tajik form	Meaning	Commentary
<i>сахтафзор</i> ³¹	hardware	SP سخت‌افزار; We have a determinative compound consisting of two elements here: <i>сахт</i> adi. 'hard' and <i>афзор</i> , which appears here with a nominal sense near to 'utensil, tool'. All in all, we have a close structural parallel to the corresponding English form here. Cf <i>нармафзор</i> .
<i>нармафзор</i> ³²	software	SP نرم‌افزار; The situation is just like in case of <i>сахтафзор</i> , the only difference being the replacement of <i>сахт</i> by <i>наرم</i> 'soft'.
<i>калид</i> ³³	[keyboard] key	SP کلید; The Tajik / Persian forms have the original meaning 'key'.
<i>муш</i> ³⁴	mouse	In Persian the calque and suffixal derivatives based on it coexist with a typical loanword in two variants, showing the different phonetic adaptation of the foreign word: <i>موشوار</i> , <i>موشی</i> , <i>ماوس</i> , <i>موس</i> . The forms

²⁹ Desktop_kdebase (11.01.2006).

³⁰ Desktop_kdebase (11.01.2006).

³¹ Desktop_kdebase (11.01.2006), GoogleTranslation (09.03.2006).

³² Libdetect (04.02.2006).

³³ Aspell (03.12.2005).

³⁴ Mandriva Install (28.01.2006).

Tajik form	Meaning	Commentary
		موس and ماوس seem to be dominating in Persian.
<i>симо</i> ³⁵	[CD-ROM] image	In SP, the Arabism تصوير is preferred in this sense. Rus. <i>образ</i>
<i>шабака</i> ³⁶	network, net	SP شبکه; Rus. <i>сеть</i>
<i>сарчаиша</i> ³⁷	source [code]	SP متن، سورس

The forms *сахтафзор* and *нармафзор* are particularly interesting, as – when considered both together – they appear to be not just simple calques. As the opposition of *сахт* : *нарт* is clear and obvious for Tajik speakers, it is in fact a structural borrowing of the little, bipolar lexical subsystem that we have here.

4. Tajik-Russian parallels

There are, of course, forms common only to Tajik and Russian, too. Their number, however, is not too great in the analysed vocabulary:

Tajik form	Meaning	Commentary
<i>справка</i> ³⁸	help [messages]	Rus. <i>справка</i>
<i>кнопка</i> ³⁹	a [keyboard] key	Rus. <i>кнопка</i> , originally from German <i>Knopf</i> . ⁴⁰
<i>клавиатура</i> ⁴¹	keyboard	Rus. <i>клавиатура</i> < Germ. <i>Klaviatur</i> , derived from Lat. <i>clavis</i> ‘a key’. ⁴²

³⁵ Mandriva (02.12.2005).

³⁶ Сайти интернетии ... (10.11.2005), Atoev (03.12.2005), Desktop_kdebase (11.01.2006).

³⁷ Mandriva (02.12.2005).

³⁸ Aspell (04.02.2006).

³⁹ Aspell (03.12.2005).

⁴⁰ Vasmer (Trubachev), 1967, tom II, p. 264.

⁴¹ Rare, attested in an unloadable webpage [www.cit.tj/cit_folder/jobs/tarikh/KeyboardT.htm], available only through its copy on Google (09.03.2006).

⁴² Tokarski, 1980, p. 356.

5. Tajik-Persian parallels

There are some instances of forms with no lexical parallel in English or Russian, being at the same time common for Tajik and Persian. Some of the linguistic calques discussed above (*сахтафзор*, *муш* etc.) belong here, too. However there are also some lexemes simply unrelated in any way to their English and Russian counterparts. Examples:

Tajik form	Meaning	Commentary
<i>ҳофиза</i> ⁴³	memory	SP حافظه; This is obviously an Arabism used commonly in both Persian and Tajik that started to be used in referring to computers only quite recently. By the way, this seems to be the only way an Arabism can enter this sphere of Tajik terminology.
<i>чопгар</i> ⁴⁴	printer	SP چاپگر; Cf. <i>принтер</i> .
<i>роёна</i> ⁴⁵	computer	SP رایانه
<i>дастгоҳи ҷониби</i> ⁴⁶	peripheral(s)	SP دستگاه(ها)ی جانبی; Cf. <i>периферия</i> . The Tajik form is a typical example of a stable determinative phrase.
<i>иҷрошаванда</i> ⁴⁷	executable	SP قابل اجرا (beside اجرashونده)
<i>манбаъ</i> ⁴⁸	source [directory, file]	SP منبع; Apart from this form, the word <i>иботи-дои</i> seems to be used in Tajik in the very same sense. ⁴⁹
<i>сафҳаи калиди</i> ⁵⁰	keyboard	SP صفحه کلید; Apart from this stable determinative phrase, a compound <i>сафҳакалид</i> is attested in Tajik, too. ⁵¹

⁴³ Libdetect (17.12.2005).

⁴⁴ Libdetect (17.12.2005).

⁴⁵ [http://www.bbc.co.uk/persian/tajikistan/story/2004/05/040517_dr_tajentertainment_cyr.shtml] (needed to be glossed).

⁴⁶ Desktop_kdebase (11.01.2006).

⁴⁷ Aspell (03.12.2005).

⁴⁸ Kompare (02.12.2005).

⁴⁹ Kompare (02.12.2005).

⁵⁰ Kxkb.desktop (09.03.2006), Navrūzšoh (15.07.2005).

⁵¹ LearnTajik (09.03.2006).

The form *poëna* is of particular interest. It is clearly a new borrowing from Persian, as the original form رایانه is a recent neologism. Indeed, it needs to be glossed in a Tajik text (as a more ‘chic’ word for computer). Interestingly, the sound-rule “Tajik [o] = Persian [ā]” is preserved here, as opposed to examples like *caim* (q.v.). This difference may be explained in the following way: *poëna* is a deliberate borrowing, a kind of linguistic game, and so it follows the conservative rules, while examples like *caim* are spontaneous.

Interestingly, there are some cases where both Tajik and Persian use the same elements to build parallel forms, however, according to different word-formation patterns, e.g.:

Tajik form	Persian	Meaning	Commentary
<i>садокарт</i> ⁵²	کارت صدا	Sound-card	A determinative compound (vs. Persian stable determinative phrase).
<i>Интернет-бозор</i> ⁵³	بازار اینترنتی	Internet-“bazaar”	Similar to the example above.
<i>дуӣ</i> ⁵⁴	دوگانی	binary	A minor difference in suffixal derivation. Both in Tajik and in Persian another lexeme (an internationalism) is used: <i>бинарӣ</i> ⁵⁵ / بیناری.

6. Specific Tajik forms

This is, probably, the most interesting sphere of the discussed vocabulary. A lack of parallel between Tajik and English or Russian is one thing, but differences between Tajik and Persian turn immediately into arguments in the discussion as to whether Tajik is a language independent from the Persian of Iran or not. Indeed, such examples are to be found. Some of them are lexemes present in Persian, but not attested in the same sense. Others are based on common Iranian morphemes but do not exist – as such – in Persian. Examples:

⁵² Libdetect (17.12.2005).

⁵³ Zamon (29.09.2005).

⁵⁴ Mandriva (02.12.2005).

⁵⁵ Cervisia (02.12.2005).

Tajik form	Meaning	Commentary
<i>нурборкунӣ</i> ⁵⁶	downloading, loading	The base form of this suffixal derivative is common to Persian and Tajik. However, different lexemes are used in Persian with the meaning of the Tajik form: دانلود بارگیری.
<i>боркунӣ</i> ⁵⁷	bootable	آغازگری SP

As we see, some level of lexical differentiation between Tajik and Persian in the analysed terminology is a fact, just as it is in the case of the Tajik vocabulary as a whole.⁵⁸

7. Complex and hybrid forms

Finally, we have to discuss a number of forms the construction of which is too complicated to include them in one of the above categories.

Tajik form	Meaning	Commentary
<i>диски сахт</i> ⁵⁹	hard disk	The whole form (i.e. the stable determinative phrase) is a calque of the English form ‘hard disk’. The very same phrase, however, contains a typical loanword (from Eng. <i>disk</i>) (cf. Rus. <i>жесткий диск</i> , Persian <i>هارد دیسک</i> , <i>hard disk</i> , (دیسک سخت)).
<i>Литсензияи Ҷамъиятии Кул</i> ⁶⁰	General Public Licence	The whole phrase is a calque of the English one. It is a double izofat construction. Its elements are two Arabisms and an internationalism borrowed via Russian.
<i>гипериншора</i> ⁶¹	hyperlink	This form contains two elements: the morpheme <i>гипер</i> [giper] (functioning here as a prefix), which is derived from the Greek <i>hyper</i> , via Russian (Russian influence is clearly traceable thanks to the initial consonant change), and Ar.-

⁵⁶ Cervisia (02.12.2005), Aspell (03.12.2005).

⁵⁷ Mandriva (02.12.2005).

⁵⁸ Perry, 2005, p. 482.

⁵⁹ Mandriva Install (28.01.2006), *Литсензияи Ҷамъиятии Кул*.

⁶⁰ Atoev (03.12.2005).

⁶¹ Zamon (10.09.2005).

Tajik form	Meaning	Commentary
		Ir. <i>uuopa</i> [išora].

Some more attention should be paid to the form *zuneuuopa*, which demonstrates that while suffixation is much more productive in both Persian and Tajik, prefixation may be noticed as well. Moreover, new prefixes of Russian origin (or introduced via Russian) appear.

8. Conclusions and commentaries

As the problem discussed in the present article deserves much more extensive research, no decisive conclusions will be articulated here. Instead, a number of remarks on the most interesting phenomena will be given.

Some influences of Russian phonetics seem to be persistent. Accepting initial consonant clusters (forms like *справка*, *сканер*) is the best example here. What is striking is the low number of Russian loanwords of Slavonic origin. Russian has served here (and is still serving) mostly as a medium of transmission of internationalisms.

The number of correspondences between Tajik and Persian is high and includes recent borrowings from the latter (like *роёна*). Isolated Tajik forms are mostly based on Iranian lexemes.

Among the indigenous Tajik forms both affixation and composition (composition *sensu stricto* beside stable determinative phrases) are attested.

In none of the cases of the analysed forms may it be proved that it has been borrowed directly from English. On the contrary, in many instances, either Russian or Persian influence is traceable.

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